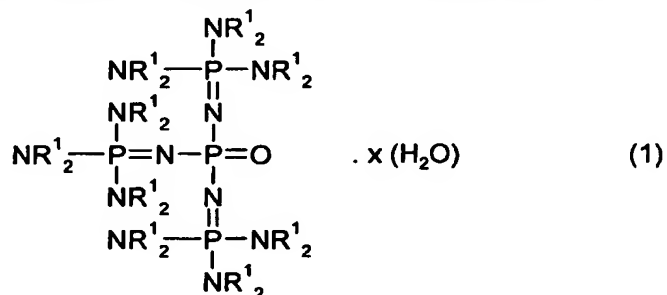


CLAIMS

1. A thermosetting polyamide foam prepared by reacting a polyisocyanate compound with a polyester polycarboxylic acid using a compound having a P=N bond as a catalyst under conditions of an NCO index of not less than 1.6.
2. A thermosetting polyamide foam according to claim 1, wherein the polyester polycarboxylic acid has an acid value of not less than 20 mgKOH/g and not more than 70 mgKOH/g, and a hydroxyl number of not more than 1/8 of the acid value.
3. A thermosetting polyamide foam according to claim 1 or 2, wherein the NCO index is not less than 2.0 and not more than 3.0.
4. A method of producing a thermosetting polyamide comprising:
reacting a polyisocyanate compound with a polycarboxylic acid using:
(a) a phosphine oxide compound represented by formula (1):

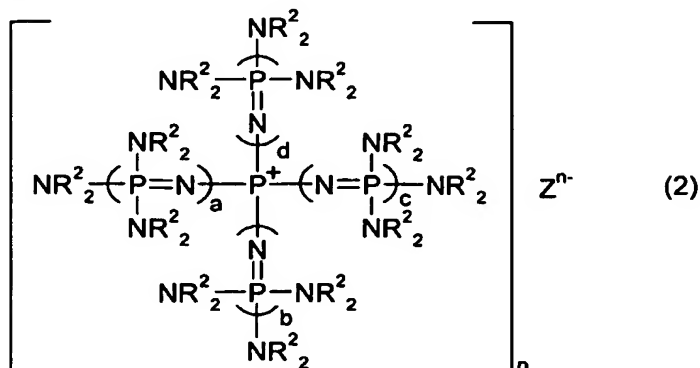


wherein:

R¹'s are independently a hydrocarbon group of 1 to 10 carbon atoms, and two R¹'s on one nitrogen atom may bind to each other to form a cyclic structure;

x, which denotes the amount of water contained in terms of molar ratio, is in the range of 0 to 5.0;

(b) a phosphazanium salt of an active hydrogen compound represented by formula (2):



wherein:

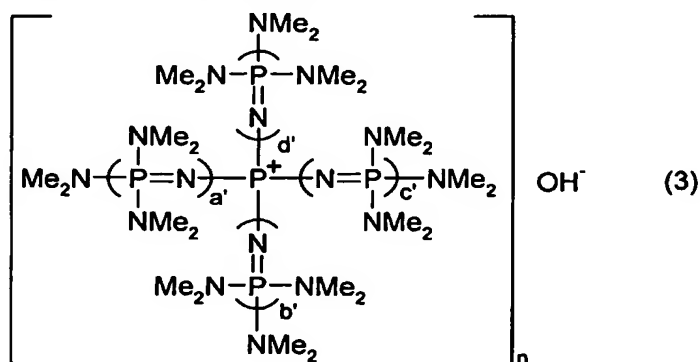
n , which is the number of phosphazanium cation, is an integer from 1 to 8;

Z^{n-} is an n -valent anion of an active hydrogen compound induced by elimination of n -protons from the active hydrogen compound having up to 8 active hydrogen atoms on an oxygen atom or on a nitrogen atom;

a , b , c and d are independently a positive integer of not more than 3 or zero, except that all of them can not be zero simultaneously; and

R^2 's are independently a hydrocarbon group of 1 to 10 carbon atoms, and two R^2 's on one nitrogen atom may bind to each other to form a cyclic structure; or

(c) a hydroxyl phosphazanium represented by formula (3):



wherein:

Me is methyl; and

a' , b' , c' and d' are independently 0 or 1, except that all of them cannot be zero simultaneously.

5. A thermosetting polyamide foam prepared by reacting a polyisocyanate compound with a polyester polycarboxylic acid using a catalyst substantially decomposed at a service temperature of the thermosetting polyamide foam.
6. A thermosetting polyamide foam according to claim 5, wherein the service temperature of the thermosetting polyamide foam is not less than 130°C and less than a decomposition temperature of the thermosetting polyamide foam.
7. A thermosetting polyamide foam according to claim 5, wherein the catalyst substantially decomposed at a service temperature of the thermosetting polyamide foam is used together with a tertiary amine compound catalyst.
8. A thermosetting polyamide foam according to claim 5, wherein the catalyst substantially decomposed at a service temperature of the thermosetting polyamide foam is used together with an alkali metal carboxylate catalyst and/or an alkaline-earth metal carboxylate catalyst.
9. A thermosetting polyamide foam according to claim 7 or 8, wherein the amount of the catalyst used in combination with the catalyst substantially decomposed at a service temperature of the thermosetting polyamide foam is less than 50% by weight of the amount of the catalyst substantially decomposed at a service temperature of the thermosetting polyamide foam.
10. A heat-resistant vibration damper comprising a thermosetting polyamide foam according to any one of claims 1 to 3 and 5 to 9.
11. A heat-resistant sound absorbing material comprising the thermosetting polyamide foam according to any one of claims 1 to 3 and 5 to 9.
12. A heat-resistant cushioning material comprising the thermosetting polyamide foam according to any one of claims 1 to 3 and 5 to 9.